Modular Reconfigurable C4I Interface (MRCI)
Demonstration of Operational Capability (DOC)
Build 1, Version 2 (V1.2)
19 February 1997
SAIC, McLean, VA

1. Purpose. The Modular Reconfigurable C4I Interface Demonstration of Operational Capability was held on 19 February 1997 at the SAIC offices in McLean, Virginia. The meeting was conducted under the terms of contract N66001-93-D-8607, Delivery Order #12. The objectives of the meeting were to:

- Communicate the status of Experimental Federation Elements.
- Communicate the status of inter-program activities.
- Discuss MRCI Software Quality Factors.
- Demonstrate the current MRCI Operational Capability.

The meeting was convened at 0830; the meeting agenda is provided as Attachment 1. The meeting was chaired by Mark Cosby, SAIC MRCI Program Manager, who gave a brief overview of the MRCI program. Attendees then introduced themselves. A complete list of points of contact is provided as Attachment 2.

2. Status of Experimental Federation Elements. The attendees were briefed on the status of the elements of the MRCI Experimental Federation.

a. Mike Hieb briefed the **RTI F, RTI S**, and **SIM/AFSAF**.

The **RTI F** has been released and will be updated in April 1997. This version provides a core set of run-time services for the main RTI service categories. Version F has full functionality. Version F has not been integrated with MRCI, but will be. The HLA/C2 testbed will use version RTI F.

RTI S Version B has been released. Version S has a smaller set of RTI services and has been optimized for STOW performance. This version has data distribution management in the form of routing spaces. RTI S Version C is scheduled for release 24 March 1997.

The **SIM/AFSAF** is an integration of SOAR/IFOR and ModSAF. An automated Wing Operations Center (aWOC) is used to manage and route communications among an existing AFIT airbase model, AFSAF and CTAPS. AFSAF SOAR/IFOR has participated in STOW-E and STOW97 combined tests and is adding new pilot behaviors. The Base Model has

been rehosted to a workstation environment (in FORTRAN). The aWOC is under development and was delivered to MRCI testing in January 1997.

b. Brenda Andrews discussed the status of **CTAPS**.

CTAPS Version 5.1.3 is currently fielded. It provides the USAF with force level (AOC) automation in planning and executing the theater air campaign. It will be the version used in the STOW and HLA C2 tests. **CTAPS** 5.2 is expected to be released in March 1997. **CTAPS** will be replaced by TBMCS version 1.0 sometime in mid-late 1998.

c. Bob Howard briefed the attendees on the status of the **MCS/P** Baseline.

MCS/P provides an Army Commander with battlefield situation awareness from battalion through corps via the current situation map and unit resource data. This information, which is distributed throughout the battlefield between **MCS/P** workstations, provides commanders and staff at all tactical echelons with timely, current information. It is currently being issued to Third US Corps and the TRADOC schools and centers.

d. Dale Anglin presented the status of **AFATDS**.

AFATDS provides the Army Commander with a fully integrated and automated fire support command and control system for the total force from platoon to corps. **AFATDS** '96 is currently fielded with **AFATDS** '97 following shortly. Operational capability will be demonstrated at IPR.

e. Rick McKenzie presented the status of **ARSAF** and **CCTT**.

ARSAF is an integration of ModSAF, the CFOR infrastructure and Command Entity Reasoner Software to add explicit, virtual representation of command nodes, command & control information exchange and command decision-making to the simulation of Army individual platforms and small units. The Automated Company Commander Command Entity has participated in STOW97 combined tests and is under continued enhancement. **ARSAF** is integrating the STOW RTI releases. Fire Support Entities are under development as is an Automated Battalion Commander Command Entity.

CCTT-SAF is an object-based SAF simulation. It is distinguished from ModSAF by its military-user oriented GUI and its extensive set of realistic unit behaviors that were developed from VV&Aed Combat Instruction Sets (CISs). It provides BLUFOR and OPFOR units from

vehicles to battalions. The MCS/P to **CCTT**-SAF prototype using the STOW A.1 RTI was demonstrated at I/ITSEC. It has been updated to use both CCSIL and Signal interactions.

f. Jerry Hill briefed the status of **CBS**.

MRCI will link to the Corps Battle Simulation (**CBS**) to demonstrate the capability, via a simple proof-of-principle scenario, of MRCI to link C4I systems to non-HLA simulations. **CBS** 1.5.4 is running at Warrior Prep Center (WPC) and a prototype of the interface is operational at the WPC. Mapping of all messages will be completed in time for demonstration at Prairie Warrior '97 scheduled for 8 to 16 May.

g. Larry Griggs described the test cell/tools including the MSST Client and Server and the RTI Test Tool, MriMain.

h. Aaron Steigerwald described and Bill Silva demonstrated the Automated Communications Effects Server System (**ACESS**). It provides the ability to emulate tactical data communications in real time. This is accomplished with two components: the Communications Effects Module (CEM) and the Communications Effects Server. The CES delivers communications degradation parameters to the CEM where they are applied to messages. The **ACESS** design has been finalized. The CES-Communications Modeling Module Interface Control Document alpha version is complete. Proof-of-Concept, version 1 is complete and version 2 is under development.

i. Mark Cosby described the current MRCI Design. Three issues raised by DOC attendees should be noted. 1) The Control Node. Mr. Cosby reviewed the MRCI design and discussed the role of the Control Node. The Control node will allow the level of MRCI intrusiveness to the C4I system to be studied. 2) Number of C4I systems/MRCI. The MRCI has been designed to allow whatever configuration makes sense in terms of the definition of the federation. Larry Griggs discussed the example of a TOC. All of the C4I systems in the TOC may form a single federate and communicate via a single MRCI, or each C4I system may be its own federate. 3) MRCI processing power requirements. The number of MRCI's which can operate on a single workstation is another issue which will be addressed in early testing.

3. Demonstration of MRCI Operational Capability. The following MRCI Components were demonstrated:

- System Specific Interfaces
  - AFATDS 1.0.06
  - MCS/P Baseline 12.01
  - CTAPS 5.1.3

- Common Modules
  - Executive
  - Translator
  - Message Handler
  - Communications

- RTI Interface Module

4. Inter-Program Activities Status. The status of inter-program activities was presented.

John Zwirner presented the status of STOW.

Mike Lightner presented the status of JSIMS.

Zack Furness presented the status of JTC.

5. MRCI Software Quality Factors. The software quality factors that must be taken into consideration as the MRCI program progresses were identified and discussed.

Larry Griggs presented an overview of the following 9 quality factors:

1. Functionality
2. Reliability
3. Maintainability
4. Availability
5. Flexibility
6. Portability
7. Reusability
8. Testability
9. Usability

MRCI software requirements associated with these quality factors were identified.

Mike Hieb detailed one of the most important of the quality factors, that of reusability. There are multiple levels of evaluation criteria related to reusability.

- Level 1 (Mil Standards)
  - Able to be used without modification of software for other C4I Federates.
  - Able to be used within new Federations via reconfiguration.
  - Reconfiguration is via flat files.
- Level 2 (Software Design)
  - Modularity of Major Components (Common Modules and RTI

Interfaces).
- API for development of new System Specific Interfaces for C4I Federates.
- Specification of future software development needs.

· Level 3 (Lifecycle Methodology)
- Documentation Requirements
- Infrastructure of Test & Message Development Tools
- Integration of SOM & FOM Methodology

6. IPR Overview. John Park presented an overview of the next IPR. It is scheduled for 26 March 1997 at the Radisson Hotel. The topics to be discussed at the IPR include:

- Review of baseline MRCI design for as-built state
- Assessment of level of compliance of design with requirements as specified at SRR and PDR
- Assessment of level of compliance of implementation with requirements as specified at SRR and PDR

Expanded demonstration of experimental federations using MRCI 1.

7. Adjourn. The DOC was adjourned at 1245